ITEM 608.22M PRECAST CONCRETE BLOCK RETAINING WALL

DESCRIPTION

Work includes furnishing and installing modular block retaining wall units to the lines and grades designated on the construction drawings and as specified herein.

Work includes preparing foundation soil, installing wall, unit fill, and furnishing and installing geogrid reinforcement to the lines and grades designated on the construction drawings.

Furnishing and installing all appurtenance materials required for construction of the retaining wall as shown on the construction drawings.

MATERIALS

REFERENCE STANDARDS

ASTM C90-85 Hollow Load Bearing Masonry Units.

ASTM C140-75 Sampling and Testing Concrete Masonry Units.

ASTM C145-85 Solid Load Bearing Concrete Masonry Units.

DELIVERY, STORAGE AND HANDLING

CONTRACTOR shall check the materials upon delivery to assure that proper material has been received.

CONTRACTOR shall prevent excessive mud, wet cement, epoxy and like materials which may affix themselves, from coming in contact with the materials.

CONTRACTOR shall protect the materials from damage. Damaged material shall not be incorporated into the retaining wall structure.

Geogrids shall be stored above -29°C. Rolled geogrid material may be laid flat or stood on end for storage.

SUBMITTALS

Samples of all products used in the work of this section.

Latest edition of manufacturers specifications for proposed materials, method of installation and list of material proposed for use.

QUALITY ASSURANCE

Soil testing and inspection service for quality control testing during earthwork operations will be supplied by the COUNTY.

CONCRETE UNITS

Masonry units shall be KeyStone Retaining Wall Units.

Concrete wall units shall have a minimum net 28 day compressive strength of 20,700 kPa. The concrete shall have a maximum moisture absorption of 96 to 128 Kg/m^3.

Exterior dimensions may vary in accordance with ASTM C90-85. Standard and Compact units shall have a minimum 0.1 square meter face area each. Mini units shall have a minimum 0.05 square meter face area each.

KeyStone Standard units shall provide a minimum of 150MPa of wall face area. Fill which is contained within the dimensions of the units may be considered as 80% effective weight.

Units shall have angled sides capable of concave and convex alignment curves with a minimum radius of 1.07m. Where applicable, for straight walls are non-angled straight side cap units.

Units shall be interlocked with non-corrosive fiberglass pins.

Units shall be interlocked as to provide a minimum 6mm setback per each course of wall height. Where applicable, zero setback of 25mm setback per course options can be used.

FIBERGLASS CONNECTING PINS

Connecting pins shall be 12mm diameter thermoset isopthalic polyester resin/protruded fiberglass reinforcement rods.

Pins shall have a minimum flexural strength of 883,000 kPa and short beam shear of 44,150 kPa.

BASE LEVELING PAD MATERIAL

Material shall consist of compacted crushed stone (703-0201) as shown on construction drawings. The compacted leveling pad shall be a minimum 150mm thick.

UNIT FILL

Fill for units shall be free draining crushed stone, 9.5mm to 19.0mm or coarse gravel (no more than 5% shall pass the No. 200 sieve with a maximum size of 19.0mm. Gradation of the fill shall be approved by the ENGINEER.

Place recommended fill behind the retaining wall units.

BACKFILL

Material shall be in situ soils when approved by the ENGINEER unless otherwise specified in the drawings. Unsuitable soils for backfill (heavy clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.

Where additional fill is required, CONTRACTOR shall submit sample and specifications to the ENGINEER to determine if acceptable.

GEOGRIDS

Geogrid products shall be high density polyethylene expanded sheet or polyester woven fiber material, specifically fabricated for use as soil reinforcement.

CONSTRUCTION DETAILS

EXCAVATION

CONTRACTOR shall excavate to the lines and grades shown on the construction drawings. Over excavation shall not be paid for and replacement with compacted fill and/or wall system components will be required at CONTRACTOR's expense. CONTRACTOR shall be careful not to disturb embankment materials beyond lines shown.

FOUNDATION SOIL PREPARATION

Foundation soil shall be excavated as required for footing dimensions shown on the construction drawings or as directed by the ENGINEER.

A. Foundation soil shall be examined by the ENGINEER to assure that the actual foundation soil strength meets or exceeds assumed design strength. Soils not meeting required strength shall be removed and replaced with acceptable material.

B. Over-excavated areas shall be filled with approved compacted backfill material.

BASE LEVELING PAD

A. Leveling pad materials shall be placed as shown on the construction drawings, upon undisturbed insitu soils, to a minimum thickness of 150 millimeters.

B. Material shall be compacted so as to provide a level hard surface on which to place the first course of units. For crushed rock, material shall be densely compacted.

C. Leveling pad shall be prepared to insure complete contact of retaining wall unit with base.

UNIT INSTALLATION

A. First course of concrete wall units shall be placed on the base leveling pad. The units shall be checked for level and alignment. The first course is the most

important to insure accurate and acceptable results.

B. Insure that units are in full contact with base.

C. Units are placed side by side for full length of wall alignment. Alignment may be done by means of a string line or offset from base line.

D. Install fiberglass connecting pins and fill all voids at units with unit fill material. Tamp fill.

E. Sweep all excess material from top of units and install next course. Insure each course is completely unit filled, backfilled and compacted prior to proceeding to next course.

F. Lay up each course insuring that pins protrude into adjoining course above a minimum of 25 millimeters. Two pins are required per unit. Pull each unit forward, away form the embankment, against pins in the previous course and backfill as the course is completed. Repeat procedure to the extent of wall height.

G. As appropriate where the wall changes elevation, units can be stepped with grade or turned into the embankment with a convex return end. Provide appropriate buried units on compacted leveling pad in area of convex return end.

CAP INSTALLATION

A. Place KeyStone Cap units over projecting pins from units below. Pull forward to set back position. Backfill and compact to finished grade.

B. As required, provide permanent mechanical connection to wall units with construction adhesive or epoxy. Apply adhesive or epoxy to bottom surface of cap units and install on units below.

GEOGRID INSTALLATION

A. The geogrid soil reinforcement shall be laid horizontally on compacted backfill. Connect to the concrete wall units by hooking geogrid over fiberglass pins. Pull taut, and anchor before backfill is placed on the geogrid.

B. Slack in the geogrid at the wall unit connections shall be removed.

C. Geogrid shall be laid at the proper elevation and orientation as shown on the construction drawings or as directed by the ENGINEER.

D. Correct orientation (roll direction) of the geogrid shall be verified by the CONTRACTOR.

E. To pretension geogrid, pull pinned geogrid taut to eliminate loose folds. Stake or secure back edge of geogrid prior to and during backfill and compaction.

F. Follow manufacturers guidelines relative to overlap requirements of uniaxial and biaxial geogrids.

METHOD OF MEASUREMENT

The quantity to be measured under this item shall be the square meters of modular block retaining wall installed per the plans or as directed by the ENGINEER.

BASIS OF PAYMENT

The unit price for each square meter shall include the cost of furnishing and installing the modular concrete units, fiberglass connecting pins, base leveling pad, unit fill and geogrids, in addition to all labor, materials and equipment necessary to complete the work as specified. Any necessary excavation will be paid for under their appropriate items.

Payment will be made under:

Item No.	Item	Pay Unit
608.22M	Precast Concrete Block Retaining Wall	SM